

In the Claims:

1 – 12. (Canceled)

13. (previously presented) Method for operating a multi-component injection moulding form tool to produce multi-layered formed bodies, comprising:

providing a multi-component injection moulding form tool having: a hot runner nozzle with a needle shut-off mechanism adapted to release or block one inner jet chamber and one outer jet chamber of the nozzle, the needle shut-off mechanism having a movable needle and at least one first plunger and one second plunger cooperating therewith, arranged such that said plungers are movable within a cylindrical barrel, each plunger being longitudinally shiftable in such a manner that the needle is brought into a selected one of a plurality of releasing/blocking positions in said one inner and one outer jet chambers whereby a component A having a first viscosity can be selectively injected through the one inner jet chamber to form a thin surface layer of new material and a component B having a viscosity greater than the viscosity of the component A can be selectively injected as a filler material through the one outer jet chamber, said method having an operating cycle comprising in sequence the following steps:

positioning the needle into a selected first one of said plurality of positions so that the one inner jet chamber and the one outer jet chamber are opened;

conveying the surface layer forming component A through the one inner jet chamber there while not conveying the filler material component B through the one outer jet chamber;

thereafter conveying component B through the one outer jet chamber in order to produce a three-layered preform with a component B content of over 35 %;

cooling the components A and B in a cooling phase there while replacing material shrunk

during the cooling phase with further component B such that the component B content amounts to over 35 vol. %; and, in order to complete the cycle; and

positioning the needle into a selected other of said plurality of positions whereby both the one inner jet chamber and the one outer jet chamber are closed.

14. (previously presented) Method according to Claim 13, characterised in that, the second step in the cycle further comprises positioning the needle into a further selected one of said plurality of positions wherein the one inner jet chamber is blocked and the one outer jet chamber is opened.

15. (currently amended) Method for operating a multi-component injection moulding form tool to produce multi-layered formed bodies, comprising:

providing a multi-component injection moulding form tool having: a hot runner nozzle with a needle shut-off mechanism adapted to release or block one inner jet chamber and one outer jet chamber of the nozzle, the needle shut-off mechanism having a movable needle and at least one initial plunger and one second plunger cooperating therewith, arranged such that said plungers are movable within a cylindrical barrel, each plunger being longitudinally shiftable in such a manner that the needle is brought into a selected one of a plurality of releasing/blocking positions in said one inner and one outer jet chambers whereby a component C can be selectively injected through the one inner jet chamber to form a thin barrier layer of barrier material and a component B can be selectively injected as a filler material through the one outer jet chamber, said method having an operating cycle comprising in sequence the following steps:

positioning the needle into a selected first one of said plurality of positions so that the one inner jet chamber and the one outer jet chamber are opened;

thereafter conveying the filler material component B through the one outer jet barrier layer forming component C through the one inner jet chamber there while not conveying the barrier layer forming component C through the one inner jet filler material component B through the one outer jet chamber;

thereafter simultaneously conveying the component C through the one inner jet chamber there while conveying the component B through the one outer jet chamber in order to produce a three-layered preform with a barrier layer of component C such that the component C content amounts to 5 % or less of the overall volume;

interrupting conveyance of component C in such a manner that there while only component B continues to be conveyed into a mould cavity from the outer jet chamber;

cooling the components B and C in a cooling phase there while replacing material shrunk during the cooling phase with further component B; and, in order to complete the cycle; and

positioning the needle into a selected other of said plurality of positions whereby both the one innermost jet chamber and the one outer jet chamber are closed.

16. (previously presented) Method as claimed in Claim 15, characterised in that the needle is left in said selected first one of said plurality of positions in the second and third steps in the cycle.

17. (previously presented) Method for producing a five-layered preform with an outer and inner skin fabricated from a component A, a barrier layer fabricated from a component C, and a filler component B, said method having an operating cycle comprising in sequence the following steps:

in a first step in the cycle, positioning a shut-off needle into a first position so that an innermost jet chamber containing component C, an outer jet chamber containing component A, and one jet chamber therebetween containing component B are opened, conveying component A

through the outer jet chamber, and not conveying components B and C;

in a second step in the cycle conveying components B and C at the same time and not conveying component A and;

in a third step in the cycle, conveyance of component C is halted and material shrunk during a cooling phase is replaced with further component B.

18. (previously presented) Method according to Claim 17, characterised in that said second step in said cycle further comprises:

conveying a component C content of approx. 5 vol. % and a component B content of over 30 % of an overall volume.

19. (withdrawn) Preform produced according to the method as claimed in Claim 13, characterised in that said preform has a component B content of over 35 vol. %.

20. (withdrawn) Preform produced according to the method as claimed in Claim 15, characterised in that said preform has a barrier layer of material C of less than approx. 5 vol. % and a material B content of over 35 vol. %.

21. (withdrawn) Preform produced according to the method as claimed in Claim 15, characterised in that said preform has a component B content of over 35 vol. %.

22. (withdrawn) Preform produced according to the method as claimed in Claim 17, characterised in that said preform has a barrier layer of material C of less than approx. 5 vol. % and a material B content of over 35 vol. %.

23. (previously presented) Method as claimed in claim 17 wherein said component C comprises nylon.

24. (previously presented) Method as claimed in claim 17 wherein said component B comprises recycled material.

25. (previously presented) Method as claimed in claim 17 wherein in said second step said components B and C are conveyed in the form of tubes, one of said components B and C lying inside the other of said components B and C.